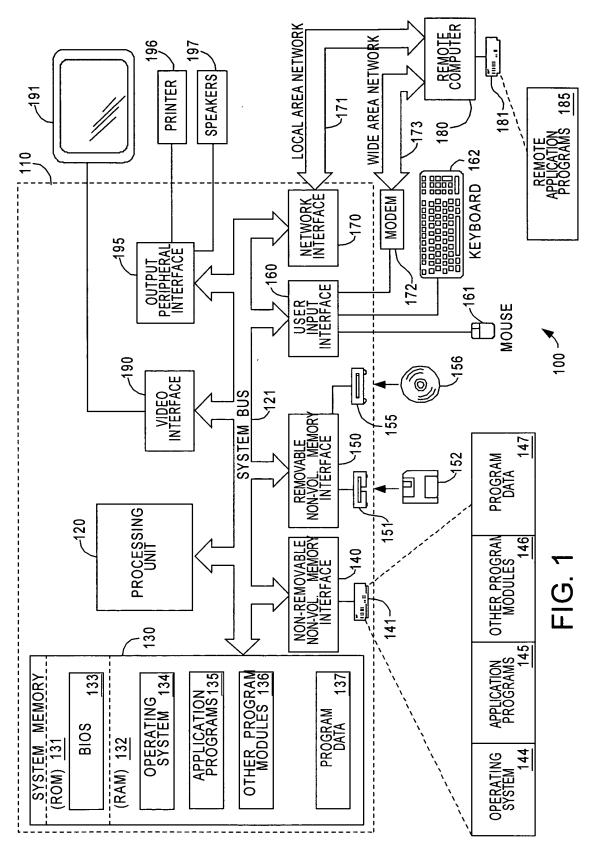Inventor: Matt Calkins et al.          Sheet 1 of 5
Filed: October 24, 2003
Title          SYSTEM SUPPORTING ANIMATION OF
GRAPHICAL DISPLAY ELEMENTS THROUGH
ANIMATION OBJECT INSTANCES
*****
Mark Joy:                    (312) 616-5600
Leydig, Voit & Mayer Ltd.    Docket # 224874
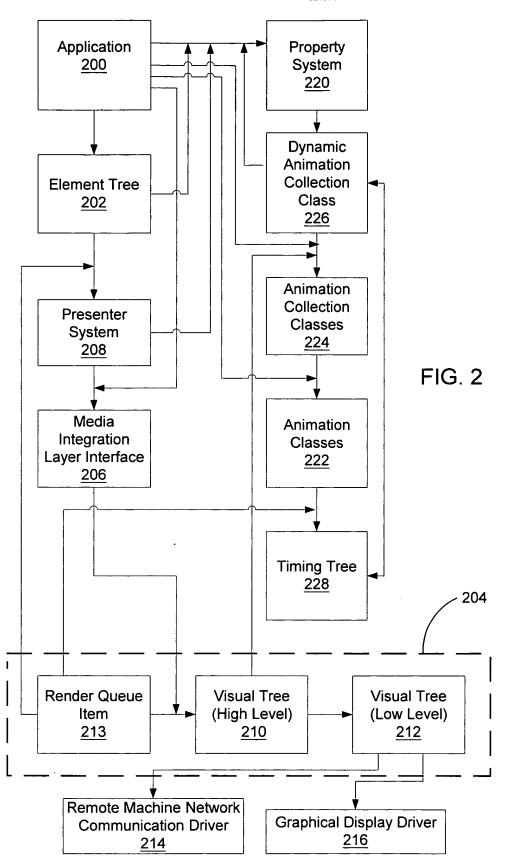
FIG. 1

Inventor: Matt Calkins et al.        Sheet 2 of 5
Filed:      October 24, 2003
Title      SYSTEM SUPPORTING ANIMATION OF
GRAPHICAL DISPLAY ELEMENTS THROUGH
ANIMATION OBJECT INSTANCES
•••••
Mark Joy:                    (312) 616-5600
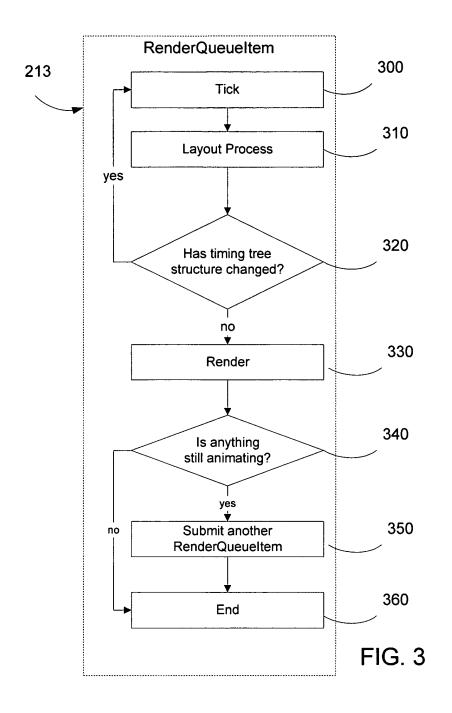Leydig, Voit & Mayer Ltd.    Docket # 224874

FIG. 2

Inventor:   Matt Calkins et al.        Sheet 3 of 5
Filed:      October 24, 2003
Title       SYSTEM SUPPORTING ANIMATION OF
GRAPHICAL DISPLAY ELEMENTS THROUGH
ANIMATION OBJECT INSTANCES
*****
Mark Joy:                          (312) 616-5600
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213

RenderQueueItem

Tick — 300

Layout Process — 310

yes

Has timing tree structure changed? — 320

no

Render — 330

Is anything still animating? — 340

no

yes

Submit another RenderQueueItem — 350

End — 360

FIG. 3

## ANIMATION CLASS

| 400 | Animation Properties |
|---|---|
| | From |
| | To |
| | By |
| | KeyValues |
| | Interpolation Method |
| | KeyTimes |
| | KeySplines |
| | IsAccumulating |
| | IsOverridingBaseValue |
| | UsesBaseValue |
| **410** | **Timing Properties** |
| | CurrentTime |
| | ParentTimeline |
| | Begin |
| | Duration |
| | Progress |
| | RepeatCount |
| | CurrentRepeat |
| | RepeatDuration |
| | Accelleration |
| | Deceleration |
| | Autoreverse |
| | End |
| | EndSynch |
| | Fill |
| | FillDefault |
| | Restart |
| | RestartDefault |
| | Speed |
| | IsForwardProgressing |
| | IsReversed |
| | IsChanging |
| | IsPaused |
| **420** | **Methods** |
| | **Animation Constructors (See Fig. 5)** |
| | BeginIn |
| | EndIn |
| | Pause |
| | Resume |
| | Seek |
| | GetUniqueInstance |
| | GetValue |
| **430** | **Events** |
| | Changed |
| | Begun |
| | Ended |
| | Paused |
| | Repeated |
| | Resumed |
| | Reversed |
| | Seeked |

FIG. 4

## ANIMATION CONSTRUCTOR TYPES

| | |
|---|---|
| 500 | From |
| 510 | To |
| 520 | From-To |
| 530 | By |
| 540 | From-By |

# FIG. 5

## ANIMATION COLLECTION CLASS

| | |
|---|---|
| 600 | Methods<br>GetUniqueInstance<br>GetValue<br>DefaultParentTimeline |
| 610 | Properties<br>IsChanging<br>IsOverridingBaseValue<br>Animations(array) |
| 620 | Events<br>Changed |

# FIG. 6

## DYNAMIC ANIMATION COLLECTION CLASS

| | |
|---|---|
| 700 | Methods<br>Constructor<br>Animation Collection<br>SetDefaultParentTimeLine<br>GetValue<br>OnChanged |
| 710 | Properties<br>OriginalDynamicProperty<br>Element<br>IsOveridingBaseValue |

# FIG. 7